

## Description of Supplementary Data

**File Name: Supplementary Data 1**

Description: Independent common variants associated with T2D at  $P < 5E-8$  from the meta-analysis.

**File Name: Supplementary Data 2**

Description: Gene loci identified by gene-based association test using GCTA-fastBAT.

**File Name: Supplementary Data 3**

Description: Common variants identified by GCTA-COJO analysis of the meta-analysis summary data at  $P_{COJO} < 5e-8$ .

**File Name: Supplementary Data 4**

Description: Multiple regression analysis of SNPs identified from the GCTA-COJO analysis

**File Name: Supplementary Data 5**

Description: Enrichment of the variance explained by SNPs in different functional categories for T2D.

**File Name: Supplementary Data 6**

Description: Gene-set enrichment analysis of the meta-analysis data by MAGMA.

**File Name: Supplementary Data 7**

Description: Enrichment of the T2D-associated genes in protein-protein interaction network.

**File Name: Supplementary Data 8**

Description: T2D-associated genes identified from the SMR analysis of the GWAS summary data from our meta-analysis and the eQTL summary data from the eQTLGen consortium.

**File Name: Supplementary Data 9**

Description: T2D-associated genes identified from the SMR analysis of the GWAS summary data from our meta-analysis and the eQTL summary data from the CAGE consortium.

**File Name: Supplementary Data 10**

Description: T2D-associated CpG methylation sites from the SMR analysis of the GWAS summary data from our meta-analysis and the mQTL data from McRae et al.

**File Name: Supplementary Data 11**

Description: Mapping the T2D-associated CpG methylation sites to the T2D-associated genes by the SMR analysis of the eQTL data from the eQTLGen consortium and the mQTL data from McRae et al.

**File Name: Supplementary Data 12**

Description: Mapping the T2D-associated CpG methylation sites to the T2D-associated genes by the SMR analysis of the eQTL data from the CAGE consortium and the mQTL data from McRae et al.

**File Name: Supplementary Data 13**

Description: Replication of the T2D-associated genes identified using the eQTLGen data in five GTEx tissues.

**File Name: Supplementary Data 14**

Description: Effects of the lead SNPs at the three putative T2D drug target gene loci on insulin-related and lipids traits.

**File Name: Supplementary Data 15**

Description: T2D association statistics of the known T1D susceptibility loci.